

REMARKS

The Office Action of March 31, 2004 has been received and carefully reviewed. Applicants note the prior art made of record in the Office Action. Claims 1, 9, 15, 16, 22, and 23 have been amended above, and claims 1-28 are currently pending in the application. Reconsideration of the application in light of the above amendments and the following remarks is respectfully requested.

I. REJECTION OF CLAIMS 1-28 UNDER 35 U.S.C. § 103.

Claims 1-28 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,642,100 to Yang et al. in view of U.S. Patent No. 5,825,068 to Yang. Reconsideration and withdrawal of these rejections is respectfully requested for at least the following reasons.

By the above amendment, independent claim 1, recites a method that comprises forming a ferroelectric capacitor and ***forming a hydrogen barrier over the ferroelectric capacitor***, wherein the hydrogen barrier comprises silicon rich silicon oxide or amorphous silicon. Independent claim 9 recites a method comprising forming a ferroelectric capacitor, and ***forming a multilayer hydrogen barrier over the ferroelectric capacitor***, wherein the hydrogen barrier comprises at least one silicon rich silicon oxide layer. Independent claim 15 recites a semiconductor device, comprising a ferroelectric capacitor and ***a hydrogen barrier over the ferroelectric capacitor***, where the hydrogen barrier comprises silicon rich silicon oxide or amorphous silicon. Independent claim 23 recites a semiconductor device, comprising a ferroelectric capacitor and a ***multilayer hydrogen barrier formed over the ferroelectric capacitor***, the hydrogen barrier comprising at least one silicon rich silicon oxide layer.

Yang et al. (6,642,100) provide a capacitor 150 (e.g., Figs. 1 and 2G) with a TiN layer 125 and a second insulating layer 126 formed over the capacitor 150 (col. 2, lines 22-24, and 37-38; col. 4, lines 16-27; Figs. 2C and 2D). Then, a metal interconnection 136 is formed on top of the second insulating layer 126 (col. 2, lines 24-26; col. 4, lines

41-45; Fig. 2E). A hydrogen barrier 138 is formed over the metal interconnect 136 (col. 2, lines 27-29 and 42-43; col. 4, lines 46-50; Fig. 2F), and an inter-metal dielectric (IMD) layer 140 is formed on the hydrogen barrier 138 (col. 3, lines 4-12; col. 4, lines 50-58; Fig. 2F).

Neither the layer 138 nor the layer 140 of Yang et al. are formed **over** the ferroelectric capacitor, per Applicants claims as amended above. Rather, the second insulating layer 126 of Yang et al. is formed *over* the capacitor 150, wherein the insulator 126 as well as the metal interconnection 136 are between the capacitor 150 and the layers 138, 140. Thus, while the layer 140 of Yang et al. may be *above* the capacitor 150, Yang et al. fail to teach ***forming a hydrogen barrier over the ferroelectric capacitor or a hydrogen barrier over the ferroelectric capacitor*** as set forth in the amended claims.

Yang (5,825,068) appears to be directed to a barrier for protecting polysilicon resistors, and does not appear to teach anything with respect to ferroelectric capacitors. Also, there is no suggestion or motivation for substituting the amorphous silicon of Yang for the second insulator layer 126 in Yang et al., or for substituting the IMD layer 140 of Yang et al. for the second insulator layer 126 in Yang et al. Thus, claims 1-28, as amended above, are patentably distinct from the proposed combination of Yang et al. with Yang, whereby reconsideration and withdrawal of the rejections thereof under 35 U.S.C. § 103 is respectfully requested.

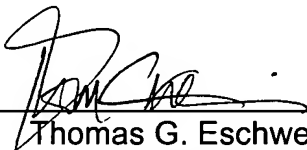
II. CONCLUSION

For at least the above reasons, the claims currently under consideration are believed to be in condition for allowance.

Should the Examiner feel that a telephone interview would be helpful to facilitate favorable prosecution of the above-identified application, the Examiner is invited to contact the undersigned at the telephone number provided below.

Should any fees be due as a result of the filing of this response, the Commissioner is hereby authorized to charge the Deposit Account Number 20-0688, TI-35996.

Respectfully submitted,
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CERTIFICATE OF MAILING (37 CFR 1.8a)

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Mail Stop Non-Fee Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Date: May 6, 2004


Christine Gillroy